

What is claimed is:

1. A wiring material comprising tungsten as its main component, wherein the wiring material contains oxygen in 30 ppm or less, and argon.

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2. A material according to claim 1 wherein electric resistivity of the wiring material is $40 \mu\Omega \cdot \text{cm}$ or less.

3. A semiconductor device having a wiring material comprising tungsten as its main component, wherein the wiring material contains oxygen in 30 ppm or less, and argon.

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4. A device according to claim 1 wherein electric resistivity of the wiring material is $40 \mu\Omega \cdot \text{cm}$ or less.

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5. A semiconductor device having a laminate structure comprising:

a tungsten film over an insulating surface; and

a tungsten nitride film.

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6. A device according to claim 5 wherein said wiring contains argon, and contains oxygen at 30 ppm or less.

7. A device according to claim 5 wherein stress of said tungsten film is -5×10^9 or over, and $5 \times 10^9 \text{ dyn/cm}^2$ or less.

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8. A device according to claim 5 wherein width of said wiring is $5 \mu\text{m}$ or less.

9. A device according to claim 5 wherein thickness of said wiring is 0.1 to 0.7 μm .

5 10. A device according to claim 5 wherein the wiring is used as a gate wiring of a TFT.

11. A device according to claim 5 wherein said semiconductor device is an active matrix liquid crystal display, an active matrix EL display or an active matrix
10 EC display.

12. A device according to claim 5 wherein said semiconductor device is one selected from a group consisting of: video camera, digital camera, projector, goggle type display, car navigation system, a personal computer and a portable information
15 terminal.

13. A semiconductor device comprising a laminate of tungsten nitride film and a tungsten film over an insulating surface, wherein a surface of said tungsten film is covered by a tungsten nitride film.

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14. A device according to claim 13 wherein said wiring contains argon, and contains oxygen at 30 ppm or less.

15. A device according to claim 13 wherein stress of said tungsten film is -5×10^9 or over, and $5 \times 10^9 \text{ dyn/cm}^2$ or less.
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16. A device according to claim 13 wherein width of said wiring is 5 μm or less.

17. A device according to claim 13 wherein thickness of said wiring is 0.1 to
5 0.7 μm .

18. A device according to claim 13 wherein the wiring is used as a gate wiring of a TFT.

10 19. A device according to claim 13 wherein said semiconductor device is an active matrix liquid crystal display, an active matrix EL display or an active matrix EC display.

20. A device according to claim 13 wherein said semiconductor device is one
15 selected from a group consisting of: video camera, digital camera, projector, goggle type display, car navigation system, a personal computer and a portable information terminal.

21. A semiconductor device comprising at least a pixel matrix circuit and a
20 driver circuit over a substrate comprising, wherein:

a portion or all of an LDD region of n-channel TFT that comprises said driver circuit is disposed so as to overlap a gate wiring of the n-channel TFT;

impurity element that imparts n-type is included in an LDD region of an n-channel TFT that forms the driver circuit at a higher concentration than in an
25 LDD region of the pixel TFT, wherein the gate wiring comprises:

a first gate wiring formed in contact with an insulating film;

a second gate wiring formed inside of the first gate wiring and formed in contact with the first gate wiring; and

a third gate wiring formed in contact with the first gate wiring and the second gate wiring.

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22. A device according to claim 21 wherein:

said first gate wiring comprises a material comprising a tungsten nitride film as its main component;

said second gate wiring comprises a material comprising tungsten as its
10 main component; and

said third gate wiring comprises a material comprising a nitride film as its main component that is formed by nitrifying the second gate wiring.

23. A device according to claim 21 wherein said semiconductor device is an
15 active matrix liquid crystal display, an active matrix EL display or an active matrix EC display.

24. A device according to claim 21 wherein said semiconductor device is one selected from a group consisting of: video camera, digital camera, projector, goggle
20 type display, car navigation system, a personal computer and a portable information terminal.

25. A semiconductor device comprising at least a pixel matrix circuit and a driver circuit over a substrate comprising, wherein:

25 a portion or all of an LDD region of n-channel TFT that comprises said driver circuit is disposed so as to overlap a gate wiring of the n-channel TFT;

an LDD region of a pixel TFT that comprises the pixel matrix circuit is disposed so as not to overlap with a gate wiring of the pixel TFT;

impurity element that imparts n-type is included in an LDD region of an n-channel TFT that forms the driver circuit at a higher concentration than in an LDD region of the pixel TFT, wherein the gate wiring comprises:

a first gate wiring formed in contact with an insulating film;

a second gate wiring formed inside of the first gate wiring and formed in contact with the first gate wiring; and

a third gate wiring formed in contact with the first gate wiring and the second gate wiring.

26. A device according to claim 25 wherein:

said first gate wiring comprises a material comprising a tungsten nitride film as its main component;

said second gate wiring comprises a material comprising tungsten as its main component; and

said third gate wiring comprises a material comprising a nitride film as its main component that is formed by nitrifying the second gate wiring.

27. A device according to claim 25 wherein said semiconductor device is an active matrix liquid crystal display, an active matrix EL display or an active matrix EC display.

28. A device according to claim 25 wherein said semiconductor device is one selected from a group consisting of: video camera, digital camera, projector, goggle type display, car navigation system, a personal computer and a portable information

terminal.

29. A method for manufacturing a semiconductor device that comprises at least a pixel matrix circuit and a driver circuit over a substrate comprising the steps of:

5 forming an active layer over a substrate;

 forming a gate insulating film in contact with the active layer;

 forming a gate wiring comprising tungsten as its main component over the gate insulating film; and

 forming an impurity region by adding an impurity element by
10 self-aligning manner using the gate wiring as a mask, wherein

 wherein said step of forming an impurity region uses a mask comprising the gate wiring and a mask over the gate wiring.

30. A method according to claim 29 wherein the gate wiring has a laminate
15 structure comprising a tungsten film and a tungsten nitride film.

31. A method according to claim 29 wherein the gate wiring is formed by sputtering.

20 32. A method for manufacturing a semiconductor device that comprises at least a pixel matrix circuit and a driver circuit over a substrate comprising the steps of:

 forming an active layer over a substrate;

 forming a gate insulating film in contact with the active layer;

 forming a gate wiring comprising tungsten as its main component over
25 the gate insulating film;

 forming an impurity region by adding an impurity element by

self-aligning manner using the gate wiring as a mask; and

forming a nitride film on a surface of the gate wiring by performing
nitridation process onto the gate wiring.

5 33. A method according to claim 32 wherein the nitridation process is
performed by generating plasma in an ammonium gas atmosphere.

34. A method according to claim 32 wherein the gate wiring has a laminate
structure comprising a tungsten film and a tungsten nitride film.

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35. A method according to claim 32 wherein the gate wiring is formed by
sputtering.